Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Vertebral osteomyelitis, discitis, and spinal epidural abscess in adults.

Bibliographic Source(s)

University of Michigan Health System. Vertebral osteomyelitis, discitis, and spinal epidural abscess in adults. Ann Arbor (MI): University of Michigan Health System; 2013 Aug. 11 p. [25 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Note from the University of Michigan Health System (UMHS) and the National Guideline Clearinghouse (NGC): The following guidance was current as of August 2013. Because UMHS occasionally releases minor revisions to its guidance based on new information, users may wish to consult the original guideline document for the most current version.

Note from NGC: The following key points summarize the content of the guideline. Refer to the full text of the original guideline document for detailed information on each of the screening procedures.

The strength of recommendation (I-III) and levels of evidence (A-D) are defined at the end of the "Major Recommendations" field.

Key Points

Clinical Presentation

For patients presenting with back pain, especially if the patient has suggestive clinical features (see Table 1 in the original guideline document) or known risk factors (see Table 2 in the original guideline document), suspicion should be high for vertebral osteomyelitis/discitis (VO) with or without spinal epidural abscess.

Diagnosis

Evaluation for VO with or without spinal epidural abscess should include:

- Complete neurologic examination *(I-C)*.
- Laboratory evaluation (complete blood count [CBC], erythrocyte sedimentation rate/C-reactive protein [ESR/CRP], basic chemistry [basic

metabolic panel (BMP)], urinalysis and culture [UA/UC], and 2 sets of blood cultures) *(II-C)*.

- Stat imaging of the spine, ideally within 2 hours if abnormal neurological findings, or within 6 hours if normal neurological findings (see Figure 1 in the original guideline document) *(I-C)*.
  - Magnetic resonance imaging (MRI) with and without contrast of the complete spine is the ideal imaging study. Omit contrast if contrast would delay imaging.
  - If MRI is not possible (e.g., because of body habitus, implanted device, etc.), a stat computed tomography (CT) myelogram should be performed (see Table 4 in the original document).
  - If CT myelogram not possible, CT with contrast of the complete spine should be performed.
- Biopsy. If there is evidence of VO on imaging and negative blood culture, then urgent/emergent biopsy by neuroradiology using imaging guidance within 24 hours *(I-C)*.

Treatment (see Figure 1 in the original guideline document)

If abnormal neurological exam or imaging evidence of spinal epidural abscess *(I-C)*:

- Stat antibiotics (see Table 3 in the original guideline document).
- Stat imaging, ideally within 2 hours if not already imaged (see Table 4 in the original guideline document).
- Stat neurosurgical consult.

If imaging evidence of VO *(I-C)*:

- If hemodynamically unstable, stat antibiotics (see Table 3 in the original guideline document).
- If hemodynamically stable, hold antibiotics until after biopsy, unless blood cultures are positive.
- Consider neurosurgery consult.
- Neurological check every 4 hours.

If hemodynamically stable, and no positive imaging or microbiological findings *(II-D)*:

- Consider other diagnosis.
- If pain persists, repeat imaging in 2 to 3 weeks.

Consult Infectious Disease Service to assist with antibiotic management and further evaluation (see Figure 1 in the original guideline document) *(II-D)*.

Definitions:

Levels of Evidence

A. Randomized controlled trials
B. Controlled trials, no randomization
C. Observational trials
D. Opinion of expert panel

Strength of Recommendation

I. Generally should be performed
II. May be reasonable to perform
III. Generally should not be performed

Clinical Algorithm(s)

An algorithm titled "Evaluation and Initial Treatment of Vertebral Osteomyelitis/Spinal Epidural Abscess (VO/SEA) (excluding postoperative infections with hardware)" is provided in the original guideline document.

Scope

Disease/Condition(s)

Disease/Condition(s)

- Vertebral osteomyelitis (VO)
- Discitis
- Paravertebral abscess
- Spinal epidural abscess

Note: This guideline does not address VO associated with hardware placed at a previous surgery.

Guideline Category

Diagnosis

Evaluation

Treatment

Clinical Specialty

Emergency Medicine

Family Practice

Infectious Diseases

Neurological Surgery

Neurology

Orthopedic Surgery

Radiology

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To improve the timely diagnosis and initial treatment of vertebral osteomyelitis (VO), discitis or paravertebral abscess with or without spinal epidural abscess in adult patients at University of Michigan Health System (UMHS)

Note: This guideline does not address antimicrobial adjustments once microorganisms have been identified, or indications for surgery.

Target Population

Adult patients with suspected or confirmed vertebral osteomyelitis (VO), discitis, paravertebral abscess or spinal epidural abscess

Interventions and Practices Considered

Diagnosis

1. Complete neurologic examination
2. Laboratory evaluation:
    - Complete blood count (CBC)
    - Erythrocyte sedimentation rate (ESR)/C-reactive protein (CRP)
    - Blood cultures
    - Basic metabolic panel (BMP)
    - Urinalysis and urine culture (UA/UC)
    - Blood cultures
3. Stat imaging of the spine
    - Magnetic resonance imaging (MRI) with and without contrast
    - Computed tomography (CT) myelogram
    - CT with contrast
4. Biopsy

Treatment

1. Antibiotics
2. Imaging
3. Neurosurgical consult
4. Neurological check every 4 hours
5. Consideration of other diagnosis (if hemodynamically stable, and no positive imaging or microbiological findings)
6. Infectious disease consult

Major Outcomes Considered

- Infections of the spine
- Diagnostic delays
- Motor weakness
- Permanent paralysis

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The literature search for this guideline was conducted prospectively using the major keywords of:

Osteomyelitis with spinal cord diseases, epidural abscess, discitis. Results were limited to human adults, and published in the English language, and January 2002 to September 2013 on MEDLINE. Additional key words included: clinical protocols, physician practice patterns, algorithms, consensus development conferences, practice guidelines, guidelines, outcomes and process assessment (health care); clinical trials, controlled clinical trials, multicenter studies, randomized controlled trials, cohort studies, metaanalysis or meta-analysis; diagnosis, diagnostic use, sensitivity and specificity, false negative reactions, false positive reactions, likelihood functions, sensitivity, specificity; predictive value therapy, drug therapy, antibiotics, staphylococcus aureus bacteremia and biopsy; diagnostic imaging, MRI, CT; neurosurgery consultation, neurosurgical procedures; infection control consultation, infectious disease medicine.

The search was conducted in components each keyed to a specific causal link in a formal problem structure (available upon request). The search was supplemented with very recent clinical trials known to expert members of the panel. The search was a single cycle.

No Cochrane Systematic Reviews were found for vertebral osteomyelitis, epidural abscess, or discitis.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

A. Randomized controlled trials
B. Controlled trials, no randomization
C. Observational trials
D. Opinion of expert panel

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Conclusions were based on prospective randomized clinical trials (RCTs) if available, to the exclusion of other data; if RCTs were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendation

I. Generally should be performed
II. May be reasonable to perform
III. Generally should not be performed

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Drafts of this guideline were reviewed in clinical conferences and by distribution for comment within departments and divisions of the University of Michigan Health System to which the content is most relevant: Emergency Medicine, Family Medicine, General Medicine, Infectious Disease, Neurosurgery, Orthopedic Surgery, Pharmacy Services, and Radiology. Medication recommendations were reviewed by the Pharmacy and Therapeutics Committee. The final version was endorsed by the Clinical Practice Committee of the University of Michigan Faculty Group Practice and the Executive Committee for Clinical Affairs of the University of Michigan Hospitals and Health Centers.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Conclusions were based on prospective randomized clinical trials (RCTs) if available, to the exclusion of other data. If RCTs were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate diagnosis and treatment for vertebral osteomyelitis (VO), discitis, paravertebral abscess, or spinal epidural abscess

Potential Harms

- The early empiric administration of antibiotics might alter the results of subsequent biopsy to identify the etiologic agent. While evidence is limited regarding the effects of antibiotics on the sensitivity of biopsy culture, most literature/experts recommend(s) withholding antibiotics for biopsy in stable patients.
- Reactions to myelographic contrast media

Contraindications

Contraindications

- Patient body habitus or indwelling devices may contraindicate magnetic resonance imaging (MRI).
- Linezolid is contraindicated in patients on medications with serotonergic activity (e.g., selective serotonin reuptake inhibitor [SSRI] and monoamine oxidase inhibitor [MAOI]).

Qualifying Statements

Qualifying Statements

These guidelines should not be construed as including all proper methods of care or excluding other acceptable methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific clinical procedure or treatment must be made by the physician in light of the circumstances presented by the patient.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Timeliness

Identifying Information and Availability

Bibliographic Source(s)

University of Michigan Health System. Vertebral osteomyelitis, discitis, and spinal epidural abscess in adults. Ann Arbor (MI): University of Michigan Health System; 2013 Aug. 11 p. [25 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2013 Aug

Guideline Developer(s)

University of Michigan Health System - Academic Institution

Source(s) of Funding

University of Michigan Health System

Guideline Committee

Vertebral Osteomyelitis Guideline Team

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Financial Disclosures/Conflicts of Interest

The University of Michigan Health System endorses the Guidelines of the Association of American Medical Colleges and the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose significant relationships with commercial companies whose products or services are discussed. Disclosure of a relationship is not intended to suggest bias in the information presented, but is made to provide readers with information that might be of potential importance to their evaluation of the information.

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Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the University of Michigan Health System Web site .

Availability of Companion Documents

Continuing Medical Education (CME) information is available from the University of Michigan Health System Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on December 12, 2013.

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